Manpower Analysis and Prediction System (MAPS)

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Outline

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- MAPS Development Objectives
- What is MAPS?
- MAPS Design Architecture
- Technology Insertion Issues
- MAPS Use
- MAPS VV&A Activities
- Challenges in Manpower Estimation
- MAPS-Unique Capability
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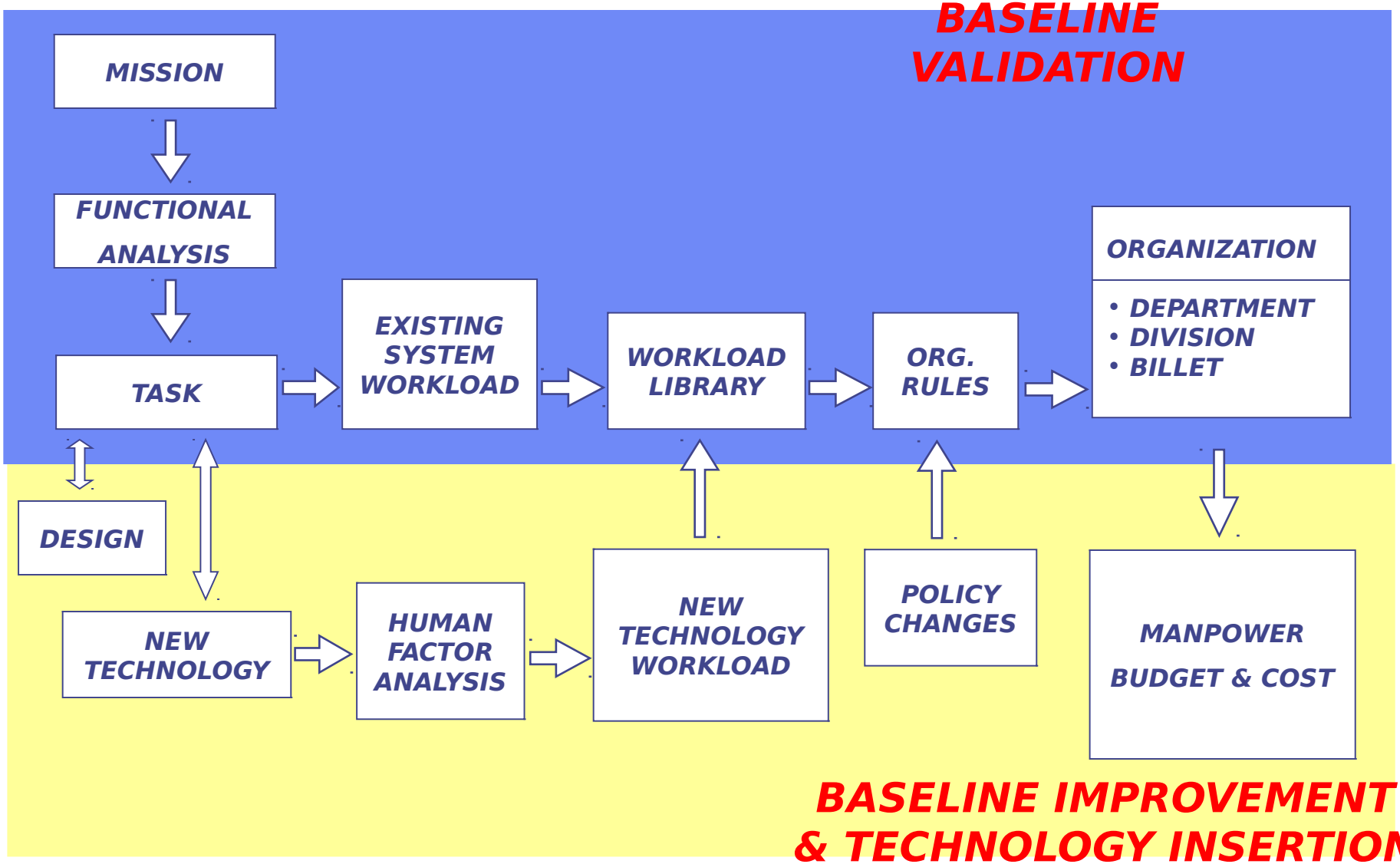
Ship Manpower Assessment Process



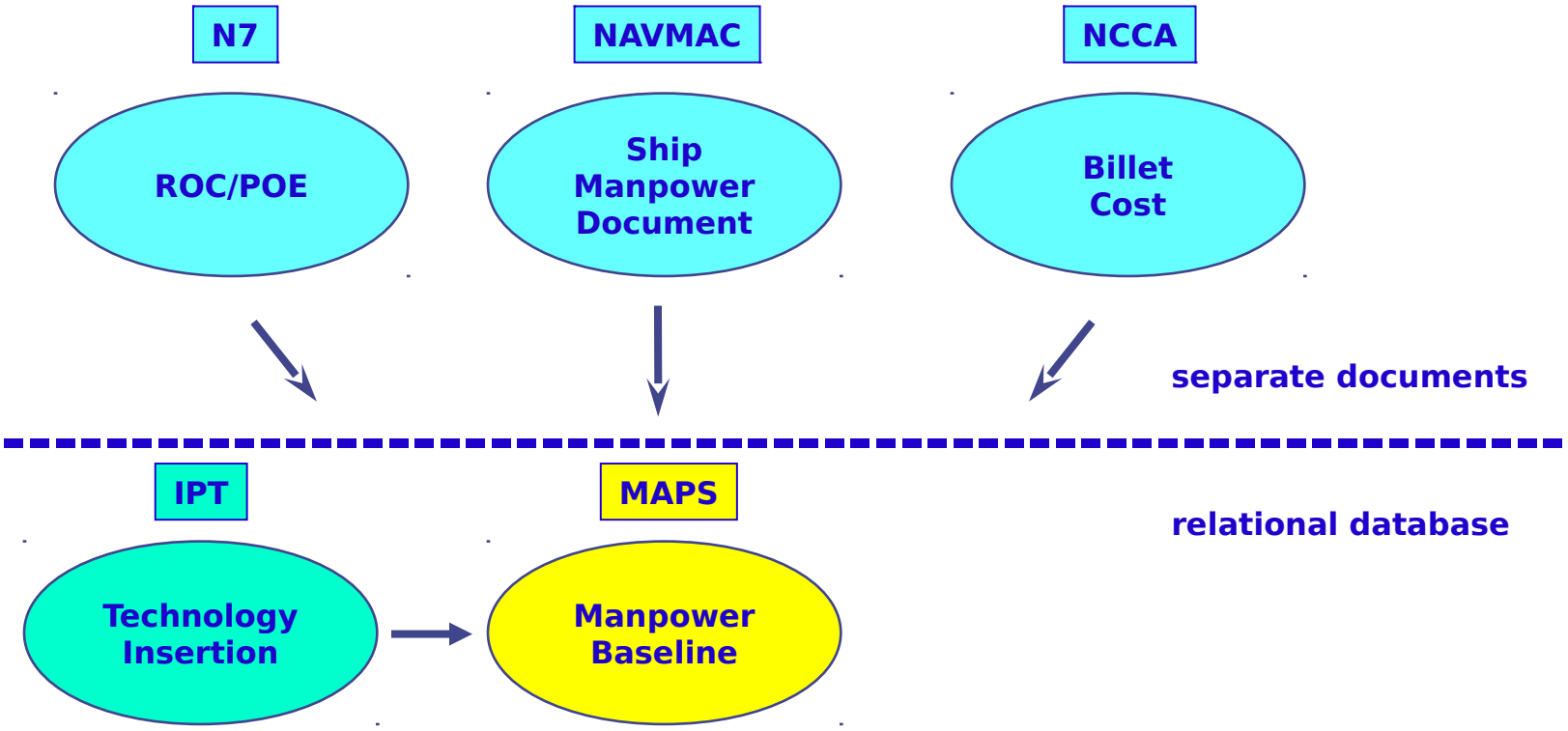
MAPS Development Objectives

- Develop manpower tools that:
  - Incorporate manpower and workload requirements in early stage of ship design
  - Analyze manpower and cost impacts on design alternatives
  - Assess technology impact on ship manpower and workload requirements

What is MAPS?

- **Evolving Carderock tool since 1996**
- **Support CVNX, JCC(X) and LHA(R) acquisitions**
- **MAPS is a family of manpower trade study tools for:**
  - **Manpower prediction**
  - **Technology insertion**
  - **Cost analysis**
- **Provide quick response to “what if” questions in manpower trade study**
- **Build on Navy-approved ship manpower methodology and add flexibility to evaluate new technologies and criteria**
- **Developed in partnership with NAVMAC**

MAPS Design Architecture

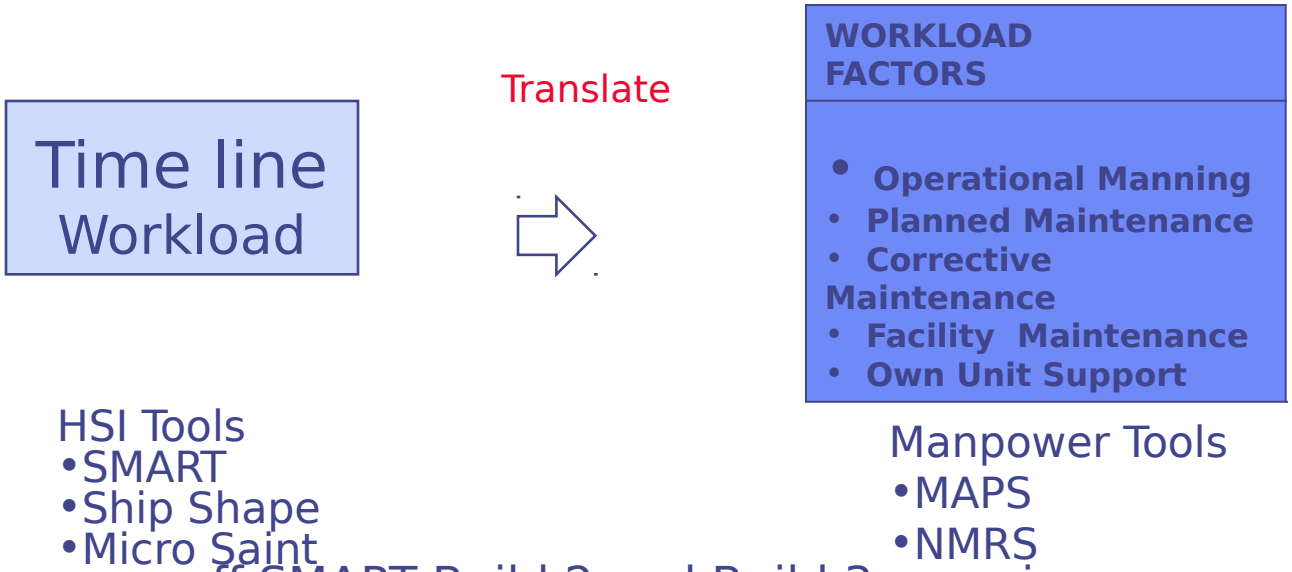


- MAPS integrates ship requirements, technology insertion, manpower methodology and cost in single model
- Provides a manpower and workload library for ship design synthesis
- MAPS integrates with ship design environment (Leading Edge Architecture for Prototyping Systems

Technology Insertion Issues

Building HSI and Manpower Interface

- Translate scenario-based workload used by the HSI world into weekly workload used by the manpower world



- Leverage off SMART Build 2 and Build 3 experiences

MAPS Use

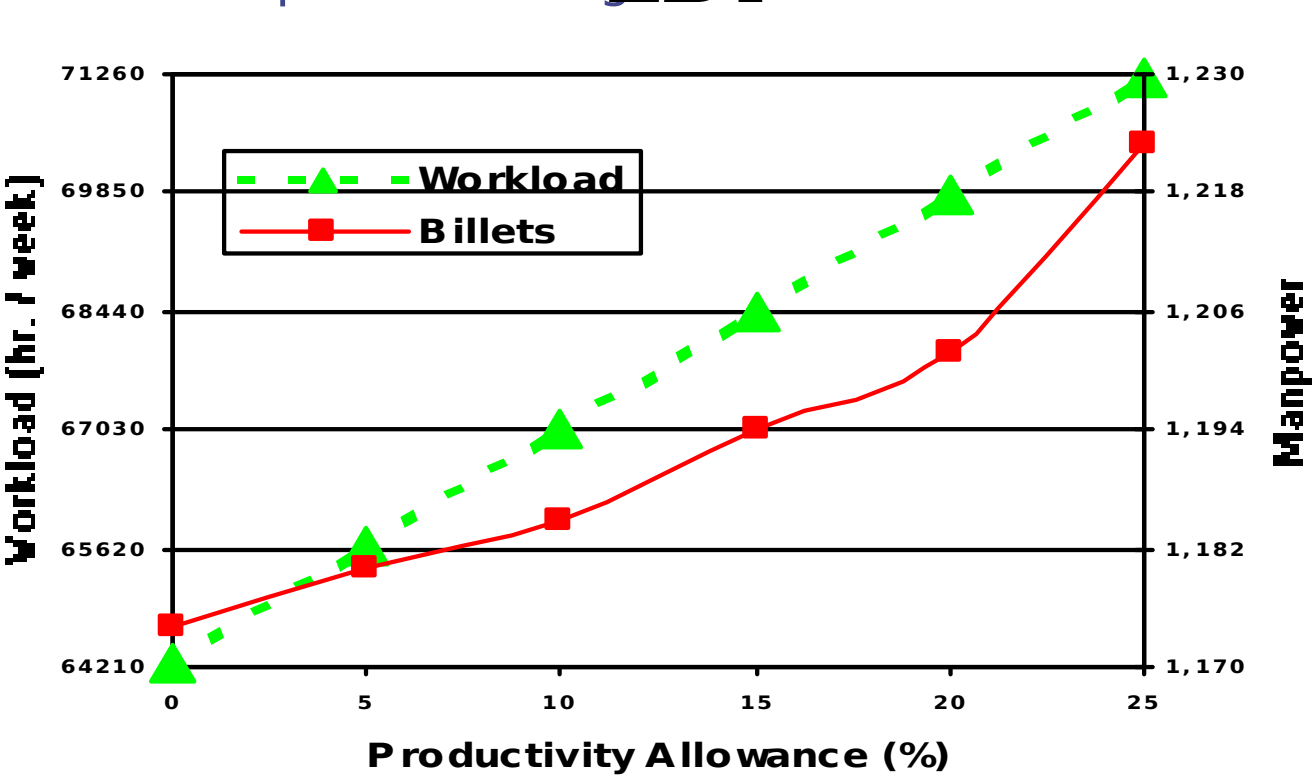
- CVNX (FY98-FY99)
  - CVN 72 manpower costs
- JCC(X) (FY00-FY02)
  - ROM manpower estimates for Navy crew and mixed crew for 50 studies
  - Functional analysis and allocation from ORD
  - LCC 19 manpower costs
- LHA(R) (FY01-FY02)
  - 21 propulsion alternatives
  - Total ship manpower estimates for six parent designs
- N12/CNA study (FY01-FY02)
  - impacts of policy changes on manpower

MAPS VV&A Activities

- Ongoing validation of MAPS with NAVMAC's NMRS
  - CVN 72 (Jul 1998)
  - CVN 72 and DDG 51 (Nov 1999)
  - DDG 51 (Aug 2001)
  - CG 47 Smart (Feb 2002)
- Verification of manpower cost data
  - Use NCCA's COMET for verified manpower costs
- Manpower model accreditation is Program Office's responsibility
  - Program Office will most likely delegate accreditation responsibility to NAVMAC

Challenges in Manpower Estimation

- Complex, non-linear relationship between workload and manpower
  - Workload reduction may lead to efficiency improvement but may or may not result in manpower saving



Apply PA to OUS, CM, and FM

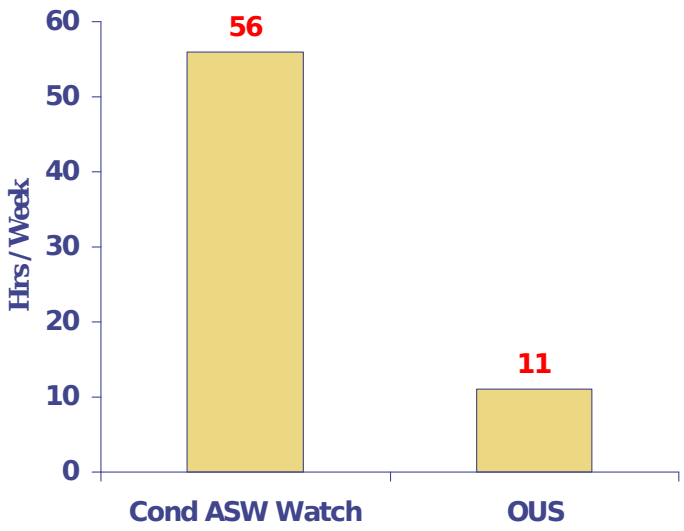
Challenges in Manpower Estimation (continue)

- Complexity is attributed to
  - Many enlisted billets perform multiple functions (OM, Maintenance, and OUS)
  - Some of billets have no measured workload:
    - manpower required to satisfy doctrine or policy (e.g., the Command Master Chief billet),
    - special skills (NECs), or
    - contingency warfighting requirements (GQ)

MAPS-Unique Capability

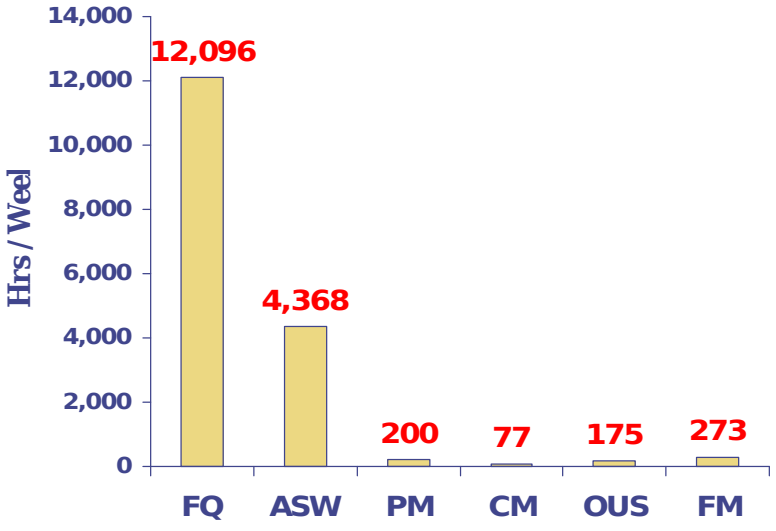
- Each billet performs multiple functions
- Workload reduction does not necessarily translate into manpower reduction

CVN 68, BSN - 023040 (AO2)



- Reducing one billet involves
  - Workload re-distribution to other billets
  - Workload driver tracking by division

G-3 Division



Manpower reduction requires advanced tools that incorporate:

- ***Workload re-distribution algorithms***
- ***Workload driver tracking database***
- ***Navy-unique manpower rules***

MAPS-Unique Capability

High Driver Report

CE division, Combat Systems Department of LHD-1

RATING	DIRECTED REQ.	WORKLOAD	COND. I	COND. IA	COND. III	FQ	ASW	WATCH STANDER	HIGH DRIVER
ET	24	22	16	15	3	0	0	3	24
IC	14	16	18	18	6	0	0	6	18
SUM									42

Summary

- MAPS provides versatile tools for:
  - Manpower prediction
  - Technology insertion
  - Cost analysis
- Provides quick response to “what if” questions
  - Linking ORD and ROC to functions, billets and cost
- Provides unique capabilities in analyzing manpower reduction
  - Workload re-distribution and high drivers tracking
- Developing MAPS interface with SMART and other HSI tools to support technology insertion and explore new concepts